United States Department of Agriculture

Economic Research Service

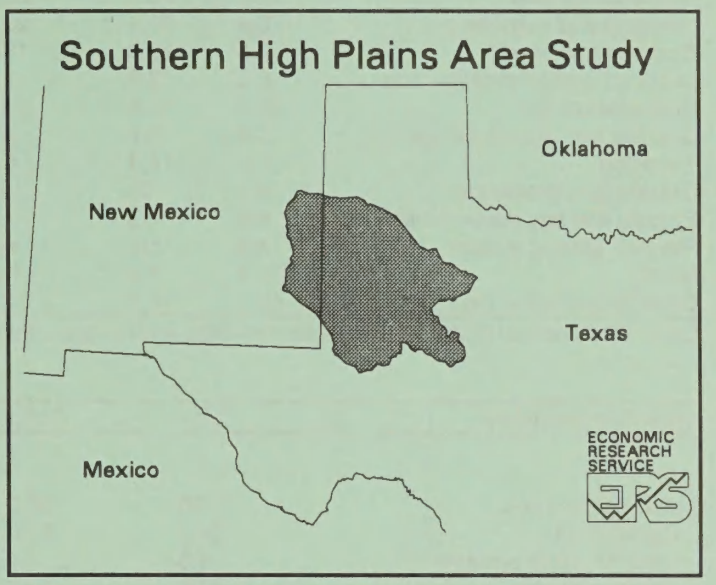
Natural Resources and Environment Division

AREI UPDATES

Updates on Agricultural Resources and Environmental Indicators Number 14 Nov. 1996

Agricultural and Conservation Practices in the Southern High Plains

- **This survey, designed to assess the factors that affect farmers' decisions to use resource-conserving farm practices, covered 19.1 million acres of agricultural land in northwest Texas and southeast New Mexico.**
- **The major agricultural land uses were range (49 percent), crops (33 percent), and CRP (11 percent). About 17 percent of the agricultural land was irrigated.**
- **Over two-thirds of the agricultural land was highly erodible and over three-fourths had high or very high soil leaching potential for chemicals.**
- **About three-fourths of the land in crops and one-fourth of the range and pastureland were under a conservation plan. Many farmers practiced some cultural methods of pest management, but few practiced biological methods. Nitrogen testing (soil and/or tissue) was used on over half of the corn area and one-fourth of the cotton acres.**



This survey was one of 11 done across the U.S. in various environmentally sensitive geographic areas where agricultural production is important. Ninety percent of the farmers surveyed in this phase of the study were located in Texas, and 10 percent were in New Mexico. The findings presented here pertain only to the agricultural and resource characteristics of the area.

Over half of the agricultural land in this region was rangeland or pasture. Cotton was the largest crop in terms of area, followed by wheat, sorghum, and corn. Almost all the cotton producers and over 70 percent of wheat farmers participated in farm programs.

A large portion of the agricultural land is highly erodible, mostly due to wind erosion. Over 80 percent of the rangeland and sorghum area and 60 percent of the cotton area were highly erodible. The most frequently used soil conservation practices on cropland were chiseling and subsoiling, conservation tillage, and crop residue use.

Irrigation is widely used in corn, cotton, sorghum, and wheat production. Center pivot irrigation technology is the most common. This region is susceptible to chemical leaching, with 77 percent of agricultural land considered to be highly leachable.

About 20 percent of the farms in this region are cash grain operations, 20 percent are livestock operations, and 45 percent grow other field crops (including cotton). Seventy percent of both cash grain and other field crop operations had gross sales of $100,000 or more. Almost half the livestock operations had gross sales of $100,000 or more.

Destruction of crop residues for host-free zones and rotations were the two most commonly used pest management practices in 1993, particularly among corn growers. Chemical dealers and professional scouts were the most common sources of paid pest-management advice.

Nitrogen-testing (either soil or tissue) as a nutrient management practice was used on over half of the corn area and one-fourth of the cotton area. One-third of the corn farmers and 17 percent of the cotton farmers stated that nitrogen-testing was the most important factor in determining nitrogen use.

Authors: Miriam Stuart (202) 501-8365 [mstuart@econ.ag.gov]; Cassandra Klotz; Catherine Kascak. Graphic: Vince Breneman.

About AREI UPDATES

AREI UPDATES is a periodic series that supplements and updates information in **Agricultural Resources and Environmental Indicators (AREI)**, USDA, ERS, AH-705, Dec. 1994. **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource use and conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **AREI UPDATES** or **AREI**, contact Richard Magleby, (202) 219-0436. [rmagleby@econ.ag.gov]

Agricultural and resource characteristics of the Southern High Plains study area, 1993

Land use	Corn	Cotton	Sorghum	Wheat	Other crops	Total crops	CRP	Pasture	Range	Other land*	Total ag. land
Acres in use (1000)	426	3,192	661	1,158	767	6,204	2,087	376	9,404	1,782	19,086
% ag. land in use	2.2	16.7	3.5	6.1	4.0	32.5	10.9	2.0	49.3	5.3	100.0
% area in govt. programs	81.4	99.1	59.0	70.4	15.7	77.9	100	n/a	n/a	n/a	40.3

*Other agricultural land includes fallow fields, set-aside, building sites, wetlands, wooded areas, and aquaculture.

Conservation practices	Corn	Cotton	Sorghum	Wheat	CRP	Pasture	Range	All ag. land
				Percent of acres				
Conservation plan	72.6	79.1	62.0	74.9	83.2	23.8	29.1	52.4
Chiseling and subsoiling	70.4	46.4	20.4	36.1	0.5	4.2	0.0	16.2
Conservation cover	7.5	13.8	15.4	29.3	87.6	16.5	1.6	17.1
Cover and green manure crop	6.2	3.0	1.7	9.8	0.9	0.0	0.0	2.3
Crop residue use	45.3	17.4	27.7	24.8	0.9	11.3	0.0	8.2
Grasses and legumes in rotation	0.0	0.2	0.0	1.8	0.0	0.0	0.0	0.8
Terracing	0.0	14.8	6.4	10.9	4.1	11.3	0.6	6.0
Grazing land protection	n/a	n/a	n/a	n/a	0.0	38.3	25.6	13.8
Pasture and hay management	n/a	n/a	n/a	n/a	0.0	12.2	0.6	1.1
Planned grazing system	n/a	n/a	n/a	n/a	0.5	14.0	39.8	21.1
No-till	0.0	1.6	1.6	3.6	n/a	n/a	n/a	1.5
Other conservation tillage	48.3	16.5	13.4	25.2	n/a	n/a	n/a	6.6

Other conservation tillage category includes ridge, mulch, and other conservation tillage methods.

Irrigation practices	Corn	Cotton	Sorghum	Wheat	Pasture	All ag. land
			Percent of acres			
Total irrigated area	100	50.8	24.7	30.3	4.2	16.9
Center pivot	54.1	23.4	10.8	16.7	0.0	8.1
Other sprinkler systems	1.3	3.4	1.6	0.2	0.0	1.0
Gravity systems	44.6	22.7	9.1	8.8	0.0	6.4
Other irrigation systems	0.0	1.2	3.2	4.6	4.2	1.4
Fertigation	3.7	5.2	2.4	4.7	0.0	2.2
Chemigation	4.9	2.0	0.0	3.1	0.0	0.9
Source of irrigation scheduling decisions:						
Consultant recommendation	22.3	1.6	0.0	5.4	0.0	1.3
Computer program	7.5	1.3	0.0	0.9	0.0	0.5

Land erodibility	Corn	Cotton	Sorghum	Wheat	Pasture	Range	CRP
% of crop on highly erodible land (HEL)	35	60	85	55	67	84	78
% of crop on HEL in no till	0	3	0	3	n/a	n/a	n/a
% of crop on HEL in other conservation tillage	52	11	14	23	n/a	n/a	n/a
% of crop on HEL in conventional tillage	48	87	86	68	n/a	n/a	n/a
% of crop on HEL in government program	76	12	73	72	n/a	n/a	100

Notes: Farmers are required to apply a conservation plan on cropped HEL if they wish to be eligible for USDA program benefits. Seventy-three percent of all agricultural land in the study area is classified as highly erodible. Erodibility levels are defined by sheet-rill and wind erosion. Seventy-one percent of the area would be classified as HEL due to wind erosion.

n/a indicates not applicable. Numbers may not add to 100 percent due to rounding or missing data.

Source: USDA, ERS, Southern High Plains Area Study data.

Agricultural and resource characteristics of the Southern High Plains study area, 1993 (cont.)

Pest and nutrient management practices	Corn	Cotton	Sorghum	Wheat	All crop land
			Percent of acres		
Type of pest management practice:					
Chemical control methods:					
Herbicides applied	84.8	98.1	42.6	9.3	67.4
Insecticides applied	30.4	33.1	0.0	4.1	21.4
Other pesticides applied	0.0	53.3	0.0	1.3	29.4
Biological control methods	0.0	2.9	0.1	3.6	2.7
Cultural control methods:					
Pest resistant varieties	21.2	15.3	15.9	7.1	14.2
Destroy residues for host-free zone	68.1	38.4	17.3	26.6	34.4
Rotations	85.2	16.4	23.2	13.1	20.4
Pest control factor in timing/location	37.1	11.4	0.1	3.7	10.2
Source of pest management advice:					
On-farm pest specialist	39.5	13.6	4.1	4.1	11.8
Extension/University/State/Federal	18.7	13.1	3.2	3.2	11.1
Chemical dealer	16.1	32.6	16.7	11.2	22.9
Professional scout	30.9	27.5	16.4	9.5	22.9
Type of nutrient management practice:					
Nitrogen testing (soil or tissue)	53.1	25.1	11.1	13.1	23.8
Manure usage	17.0	2.8	3.4	5.0	4.6
Most important factor influencing N use:					
Fertilizer company recommendation	9.9	6.3	3.5	1.4	4.8
Consultant recommendation	3.7	4.6	3.2	3.1	4.3
Crop appearance	0.0	25.7	12.2	17.5	20.6
Soil/tissue test	33.4	17.1	7.9	6.8	15.5
Extension service	3.7	2.5	0.6	3.2	2.4
Standard amount for crop/rotation	44.3	16.7	13.4	10.5	16.1

Nutrient use	Corn	Cotton	Sorghum	Wheat
Avg. lbs/acre/year on fertilized area:				
Nitrogen	212.4	61.9	65.2	70.2
Phosphate	52.8	28.1	18.0	18.8
Potash	7.9	9.2	3.2	1.9
Percent of crop area fertilized	95.1	76.1	30.5	35.3

Pesticide use	Corn		Cotton		Sorghum	
	Lbs/ acre	*Percent of acres*	*Lbs/ acre*	*Percent of acres*	*Lbs/ acre*	*Percent of acres*
Herbicides:						
Atrazine	0.72	79	*	*	0.50	11
Glyphosate	--	--	0.57	21	--	--
Paraquat	--	--	0.28	12	--	--
Pendimethalin	0.59	9	0.63	14	*	*
Prometryn	--	--	0.55	23	*	*
Propazine	--	--	--	--	0.37	13
Trifluralin	0.63	12	0.65	86	0.60	9
Insecticides:						
Aldicarb	*	*	0.37	18	--	--
Dicrotophos	--	--	0.35	4	--	--
Phorate	--	--	0.45	6	--	--

*Indicates too few observations for estimation. -- Indicates no use reported.

Source: USDA, ERS, Southern High Plains Area Study data.

Agricultural and resource characteristics of the Southern High Plains study area, 1993 (cont.)

Gross value of farm sales ($)	Cash grains	Other field crops	Beef, hogs, sheep, dairy & oth. livestock	CRP only
		Percent of farms		
$0-9,999	1.3	0.9	10.4	29.3
10,000-19,999	2.7	0.9	9.1	27.3
20,000-29,999	5.4	3.8	5.8	11.1
30,000-39,999	5.4	1.6	4.5	8.1
40,000-59,999	6.7	5.0	9.7	8.1
60,000-99,999	9.4	19.2	13.0	7.1
100,000-249,999	38.9	42.3	23.4	3.0
250,000-499,999	21.5	18.6	13.6	3.0
500,000 and up	8.7	7.6	10.4	3.0
Share of total farms	19.1	44.7	21.5	13.1

Soil leaching potential[1]	Corn	Cotton	Sorghum	Wheat	Pasture	Range	CRP	All ag. land
				Percent of acres[2]				
Very low	0	0	0	0	0	1	0	0
Low	18	11	6	12	0	3	5	6
Moderate	10	6	3	14	47	23	7	16
High	51	30	19	35	21	34	27	31
Very high	22	53	72	39	32	39	61	46
Unknown	0	0	0	0	0	1	0	0

Note: Forty-four percent of highly leachable cropland (high or very high categories) was irrigated.

[1]Soil leaching potential (SLP) = texture component + organic component + pH component. Potential of soils to leach highly soluble chemicals, based on intrinsic soil properties. Algorithm developed by J.B. Weber and R.L. Warren, North Carolina State University, in Weber, J.B. and R.L. Warren, "Herbicide Behavior in Soils: A Pesticide/Soil Ranking System for Minimizing Groundwater Contamination," *Proceedings of the Northeastern Weed Science Society,* Vol. 46, 1992.

[2]May not add to 100 percent due to rounding.

Source: USDA, ERS, Southern High Plains Area Study data .

Area Studies Project

The Area Studies project is a data collection and modeling effort which links farm production activities to environmental characteristics for selected regions. The effort involves the Economic Research Service (ERS), the Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), and the National Agricultural Statistics Service (NASS).

The Southern High Plains region was one of the 11 areas included in the project. The surveys were conducted over a 3 year period, between 1991 and 1993, and sites were selected from those included in USGS's National Water Quality Assessment Program. Each area chosen for the study had significant cropland and agricultural chemical use. Detailed information on production technologies, cropping systems, and agricultural practices at both the field and whole farm level were collected. The survey sample points were chosen to correspond with National Resource Inventory (NRI) sample points, for which NRCS had collected soil, water, and other natural resource data.

AREI UPDATES
Natural Resources and Environment Division
1301 New York Ave., NW., Rm. 524
Washington, DC 20005-4788